

From the
INTERNATIONAL SEARCHING AUTHORITY

see form PCT/ISA/220

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/GB2006/002878

International filing date (day/month/year)
03.08.2006

Priority date (day/month/year)
30.11.2005

International Patent Classification (IPC) or both national classification and IPC
INV. A01N31/08 A01N35/02 A01N31/16 A01N31/02 A01N35/06 A01N49/00 A01N25/28 A01P3/00 A01P7/02
ADD. A01P5/00

Applicant
EDEN RESEARCH PLC

- 1. This opinion contains indications relating to the following items:**

- | | |
|--|--|
| <input checked="" type="checkbox"/> Box No. I | Basis of the opinion |
| <input type="checkbox"/> Box No. II | Priority |
| <input type="checkbox"/> Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> Box No. V | Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> Box No. VI | Certain documents cited |
| <input checked="" type="checkbox"/> Box No. VII | Certain defects in the international application |
| <input checked="" type="checkbox"/> Box No. VIII | Certain observations on the international application |

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 *bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/SA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

**Date of completion of
this opinion**

see form
PCT/SA/210

Authorized Officer

Molina de Alba, José

Telephone No. +49 89 2399-7823



**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/GB2006/002878

Box No. I Basis of the opinion

1. With regard to the language, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ on paper
 - ☐ in electronic form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in electronic form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
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Box No. V Reasoned statement under Rule 43b/s.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-28
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1-28
Industrial applicability (IA)	Yes: Claims	1-28
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

1) Reference is made to the following documents:

- D1: WO 2005/070213 A2 (EDEN RES PLC [GB]; FRANKLIN LANNY [US]; OSTROFF GARY [US]) 4 August 2005 (2005-08-04)
- D2: WO 00/05964 A (ECOSMART TECHNOLOGIES INC [US]; BESSETTE STEVEN M [US]; BEIGLER MYRON) 10 February 2000 (2000-02-10)
- D3: WO 03/051121 A2 (ECOSMART TECHNOLOGIES INC [US]) 26 June 2003 (2003-06-26)
- D4: US-A-4 049 828 (COLE LARRY K) 20 September 1977 (1977-09-20)

2) The present application relates to methods of control of insects and arachnids, the methods comprising administering to the insects or arachnids an effective dose of a hollow glucan particle or cell wall particle encapsulating a terpene component.

3) The application contains overlapping subject-matter with the copending application PCT GB 2006/002881. The Applicant's attention is drawn to the PCT Guideline ISPE 11.10.

4) Re Item V

4.1 Novelty (Art. 33(2) PCT)

None of the cited documents disclose a method of control of insects and arachnids comprising terpenes, **wherein the terpene is encapsulated into a hollow glucan particle or a cell wall particle**. The subject-matter claimed is therefore regarded as novel.

4.2 Inventive Step (Art. 33(3) PCT)

D1 discloses (cf. pg. 1, l. 3-7) nematicidal compositions based on a terpene component. In a preferred embodiment, the terpene component is encapsulated into hollow glucan particles or cell wall particles (cf. pg. 13, l. 30-pg. 14, l. 20 and pg. 18, l. 28-pg. 19, l. 14). This particular formulation provides the following advantages:

- Maximization of payload;
- Minimization of unencapsulated payload;

- Control of payload stability;
- Control of release kinetics;
- Creation of a solid form of a liquid terpene to increase the mass and uniformity;
- Simplify handling and application of terpenes;
- Mask the smell and taste of the terpene.

A detailed study of the encapsulation of terpenes such as citral, terpineol, β -ionone, geraniol, L-carvone, thymol, and mixtures thereof into hollow glucan particles is also provided in the examples 1 to 21. Finally, the efficiency of the encapsulated terpenes as nematocides has been tested, showing that compositions comprising the encapsulated terpenes are as effective as terpenes in solution or with surfactants, i.e. the nematocidal activity is retained despite the terpene being encapsulated within the particle (cf. Example 22).

D2 and **D3** disclose (cf. **D2**: examples; **D3**: Tables 4, 5, and 7-23) the insecticidal properties of several terpenes (e.g. limonene, eugenol, terpineol, citronellal, anethole, pulegone, carvacrol, or thymol) and terpene blends against cockroaches, spider mites, Asian armyworms, and peach aphids.

D4 relates to (cf. abstract and tables 1-3) the insecticidal, nematocidal, and insect repellent effects of citral.

Any of **D1** to **D4** may be regarded as the closest state of the art.

Starting from **D1** as the closest prior art, the claimed subject-matter differs in that the terpenes are used for the control of insects and mites instead of nematodes. The use of the encapsulated terpenes of **D1** for the control of insects and mites is however obvious in the light of any of **D2** to **D4**, which disclose the insecticidal and miticidal properties of the terpenes of **D1**.

If **D2** to **D4** are regarded as the closest state of the art, the claimed subject-matter differs in that the terpenes have been encapsulated into hollow glucan particles or cell wall particles. The method for encapsulating the terpenes of **D2** to **D4** into the mentioned particles and the advantages derived therefrom are widely disclosed in **D1** which, therefore, renders the claim subject-matter obvious.

4.3 Industrial applicability (Art. 33(4) PCT)

It is acknowledged for the whole set of claims.

5) Re Item VII

The documents cited in the description do not appear to be essential to the performance of the invention as required by Article 5 PCT. Thus, the phrases on pg. 6, l. 1-3 and pg. 16, l. 18-19 should be deleted (see PCT Guidelines ISPE 4.26).

6) Re Item VIII

The following unclarities (Art. 6 PCT) should be dealt with:

- The description lacks conciseness, since it relates in a large extension to methods and formulations which do not belong to those defined in the claims. Furthermore, only Example 23 appears to fall within the scope of the claims.
- The vague phrase "or the like" in Claim 10 renders the scope of the claim unclear.
- Claim 13 discloses a method of treating or preventing infestation of a plant, but it does not indicate the kind of infestation to which it relates.